IN THE CLAIMS

Kindly enter the following amended claims.

47. (3 x Amended) A method of stimulating stem cell proliferation comprising contacting hematopoietic cells with a stem cell proliferation stimulating amount of INPROL or an opiate compound or a stem cell proliferation stimulating amount of a combination of INPROL and an opiate compound,

wherein said INPROL is selected from the group consisting of

a polypeptide having the sequence of amino acids 1-97 of the human alpha hemoglobin chain,

a polypeptide having the sequence of amino acids 1-94 of the human alpha hemoglobin chain,

Phe-Pro-His-Phe-Asp-Leu-Ser-His-Gly-Ser-Ala-Gln-Val (SEQ ID NO:1),

Cys-Phe-Pro-His-Phe-Asp-Leu-Ser-His-Gly-Ser-Ala-Gln-Val-Cys (SEQ ID NO:2)

(where the two Cys residues form a disulfide bond),

Asp-Ala-Leu-Thr-Asn-Ala-Val-Ala-His-Val-Asp-Asp-Met-Pro-Asn-Ala-Leu-Ser-Ala (SEQ ID NO:3),

Phe-Leu-Gly-Phe-Pro-Thr (SEQ ID NO: 33),

Leu-Val-Val-Tyr-Pro-Trp-Thr-Gln-Arg-Phe (SEQ ID NO:4),

Leu-Val-Val-Tyr-Pro-Trp-Thr-Gln-Arg (SEQ ID NO:5),

Leu-Val-Val-Tyr-Pro-Trp-Thr-Gln (SEQ ID NO:6),

Leu-Val-Val-Tyr-Pro-Trp-Thr (SEQ ID NO:7),

Leu-Val-Val-Tyr-Pro-Trp (SEQ ID NO:8),

Leu-Val-Val-Tyr-Pro (SEQ ID NO:9),

Val-Val-Tyr-Pro-Trp-Thr-Gln (SEQ ID NO:10),

Tyr-Pro-Trp-Thr-Gln-Arg-Phe (SEQ ID NO:11),

Tyr-Pro-Trp-Thr-Gln-Arg (SEQ ID NO:12),

Tyr-Pro-Trp-Thr-Gln (SEQ ID NO:13), and

Tyr-Pro-Trp-Thr (SEQ ID NO:27);

wherein said stem cells are cells which can generate multiple lineages or other stem cells.

48. (2 x Amended) A method as in claim 47 wherein said INPROL is selected from the group consisting of

a polypeptide having the sequence of amino acids 1-97 of the human alpha hemoglobin chain, and

a polypeptide having the sequence of amino acids 1-94 of the human alpha hemoglobin chain.

49. (3 x Amended) A method as in claim 47 wherein said INPROL is selected from the group consisting of peptides having the sequence:

Phe-Pro-His-Phe-Asp-Leu-Ser-His-Gly-Ser-Ala-Gln-Val (SEQ ID NO:1),

Cys-Phe-Pro-His-Phe-Asp-Leu-Ser-His-Gly-Ser-Ala-Gln-Val-Cys (SEQ ID NO:2)

(where the two Cys residues form a disulfide bond),

Asp-Ala-Leu-Thr-Asn-Ala-Val-Ala-His-Val-Asp-Asp-Met-Pro-Asn-Ala-Leu-Ser-Ala (SEQ ID NO:3),

Phe-Leu-Gly-Phe-Pro-Thr (SEQ ID NO:33),

Leu-Val-Val-Tyr-Pro-Trp-Thr-Gln-Arg-Phe (SEQ ID NO:4),

Leu-Val-Val-Tyr-Pro-Trp-Thr-Gln-Arg (SEQ ID NO:5),

Leu-Val-Val-Tyr-Pro-Trp-Thr-Gln (SEQ ID NO:6),

Leu-Val-Val-Tyr-Pro-Trp-Thr (SEQ ID NO:7),

Leu-Val-Val-Tyr-Pro-Trp (SEQ ID NO:8),

Leu-Val-Val-Tyr-Pro (SEQ ID NO:9),

Val-Val-Tyr-Pro-Trp-Thr-Gln (SEQ ID NO:10),

Tyr-Pro-Trp-Thr-Gln-Arg-Phe (SEQ ID NO:11),

Tyr-Pro-Trp-Thr-Gln-Arg (SEQ ID NO:12),

Tyr-Pro-Trp-Thr-Gln (SEQ ID NO:13), and

Tyr-Pro-Trp-Thr (SEQ ID NO:27).

50. (Amended) A method as in claim 47 wherein said opiate compound is selected from the group consisting of morphine, etorphine, codeine, heroin, hydromorphone, oxymorphone, levorphanol, levallorphain, hydrocodone, oxycodone, nalorphine, naloxone, buprenorphine, butanorphanol, nalbuphine, meperidine,

alphaprodine, diphenoxylate, fentanyl, (D-Ala^2,N-Me-Phe^4,glycinol^5)-Enkephalin, (D-Arg^2,Lys^4)-Dermorphin (1-4) amide and nociceptin.

51. (2 x Amended) A method of stimulating stem cell proliferation comprising contacting hematopoietic cells with a stem cell proliferation stimulating amount of a compound capable of binding opiate receptors, wherein said stem cells are cells which can generate multiple lineages or other stem cells.

92. (Amended) The method of claim 49, comprising contacting hematopoietic cells with a stem cell proliferation stimulating amount of Cys-Phe-Pro-His-Phe-Asp-Leu-Ser-His-Gly-Ser-Ala-Gln-Val-Cys (SEQ ID NO:2) wherein the two Cys residues form a disulfide bond.

95. (2 x Amended) A method of stimulating stem cell proliferation comprising contacting stem cells with a stem cell proliferation stimulating amount of INPROL or an opiate compound or a stem cell proliferation stimulating amount of a combination of INPROL and an opiate compound,

wherein said INPROL is selected from the group consisting

a polypeptide having the sequence of amino acids 1-97 of the human alpha hemoglobin chain,

a polypeptide having the sequence of amino acids 1-94 of the human alpha hemoglobin chain,

Phe-Pro-His-Phe-Asp-Leu-Ser-His-Gly-Ser-Ala-Gln-Val (SEQ ID NO:1),

Cys-Phe-Pro-His-Phe-Asp-Leu-Ser-His-Gly-Ser-Ala-Gln-Val-Cys (SEQ ID NO:2)

(where the two Cys residues form a disulfide bond),

Asp-Ala-Leu-Thr-Asn-Ala-Val-Ala-His-Val-Asp-Asp-Met-Pro-Asn-Ala-Leu-Ser-Ala (SEQ ID NO:3),

Phe-Leu-Gly-Phe-Pro-Thr (SEQ ID NO:33),

Leu-Val-Val-Tyr-Pro-Trp-Thr-Gln-Arg-Phe (SEQ ID NO:4),

Leu-Val-Val-Tyr-Pro-Trp-Thr-Gln-Arg (SEQ ID NO:5),

Leu-Val-Val-Tyr-Pro-Trp-Thr-Gln (SEQ ID NO:6),

Leu-Val-Val-Tyr-Pro-Trp-Thr (SEQ ID NO:7),
Leu-Val-Val-Tyr-Pro-Trp (SEQ ID NO:8),
Leu-Val-Val-Tyr-Pro (SEQ ID NO:9),
Val-Val-Tyr-Pro-Trp-Thr-Gln (SEQ ID NO:10),
Tyr-Pro-Trp-Thr-Gln-Arg-Phe (SEQ ID NO:11),
Tyr-Pro-Trp-Thr-Gln-Arg (SEQ ID NO:12),
Tyr-Pro-Trp-Thr-Gln (SEQ ID NO:13), and
Tyr-Pro-Trp-Thr (SEQ ID NO:27);

wherein said stem cells are cells which can generate multiple lineages or other stem cells.

96. A method as in claim 95 wherein said INPROL is selected from the group consisting of

a polypeptide having the sequence of amino acids 1-97 of the human alpha hemoglobin chain, and

a polypeptide having the sequence of amino acids 1-94 of the human alpha hemoglobin chain.

97. (Amended) A method as in claim 95 wherein said INPROL is selected from the group consisting of peptides having the sequence:
Phe-Pro-His-Phe-Asp-Leu-Ser-His-Gly-Ser-Ala-Gln-Val (SEQ ID NO:1),
Cys-Phe-Pro-His-Phe-Asp-Leu-Ser-His-Gly-Ser-Ala-Gln-Val-Cys (SEQ ID NO:2)

(where the two Cys residues form a disulfide bond),
Asp-Ala-Leu-Thr-Asn-Ala-Val-Ala-His-Val-Asp-Asp-Met-Pro-Asn-Ala-Leu-Ser-Ala (SEQ ID NO:3),
Phe-Leu-Gly-Phe-Pro-Thr (SEQ ID NO:33),
Leu-Val-Val-Tyr-Pro-Trp-Thr-Gln-Arg-Phe (SEQ ID NO:4),
Leu-Val-Val-Tyr-Pro-Trp-Thr-Gln-Arg (SEQ ID NO:5),
Leu-Val-Val-Tyr-Pro-Trp-Thr-Gln (SEQ ID NO:6),
Leu-Val-Val-Tyr-Pro-Trp-Thr (SEQ ID NO:7),
Leu-Val-Val-Tyr-Pro-Trp (SEQ ID NO:8),

Leu-Val-Val-Tyr-Pro (SEQ ID NO:9),
Val-Val-Tyr-Pro-Trp-Thr-Gln (SEQ ID NO:10),
Tyr-Pro-Trp-Thr-Gln-Arg-Phe (SEQ ID NO:11),
Tyr-Pro-Trp-Thr-Gln-Arg (SEQ ID NO:12),
Tyr-Pro-Trp-Thr-Gln (SEQ ID NO:13), and
Tyr-Pro-Trp-Thr (SEQ ID NO:27).

Please add the following new claims:

100. (New) A method of stimulating stem cell proliferation consisting essentially of contacting hematopoietic cells with a stem cell proliferation stimulating amount of INPPOL or an opiate compound or a stem cell proliferation stimulating amount of a combination of INPROL and an opiate compound,

wherein said INPROL is selected from the group consisting of the alpha chain of hemoglobin, the beta chain of hemoglobin, the gamma chain of hemoglobin, the delta chain of hemoglobin, the epsilon chain of hemoglobin, and the zeta chain of hemoglobin.

101. (New) A method as in claim 100 wherein said opiate compound is selected from the group consisting of morphine, etorphine, codeine, heroin, hydromorphone, oxymorphone, levorphanol, levallorphain, hydrocodone, oxycodone, nalorphine, naloxone, buprenorphine, butanorphanol, nalbuphine, meperidine, alphaprodine, diphenoxylate, fentanyl, (D-Ala^2,N-Me-Phe^4,glycinol^5)-Enkephalin, (D-Arg^2,Lys^4)-Dermorphin (1-4) amide and nociceptin.

102. (New) A method of stimulating stem cell proliferation consisting essentially of contacting stem cells with a stem cell proliferation stimulating amount of INPROL or an opiate compound or a stem cell proliferation stimulating amount of a combination of INPROL and an opiate compound,

wherein said INPROL is selected from the group consisting of the alpha chain of hemoglobin, the beta chain of hemoglobin, the gamma chain of hemoglobin, the delta

chain of hemoglobin, the epsilon chain of hemoglobin, and the zeta chain of hemoglobin.

IN THE SEQUENCE LISTING

Kindly enter the attached substitute paper and computer readable forms of the Sequence Listing for those submitted on March 13, 2000.